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Nucleic acid compositions encoding a pro-apoptotic protein, Bok (Bcl-2-related ovarian killer) are identified. Bok has conserved Bcl-2 homology domains 1, 2 and 3 and a C-terminal transmembrane region present in other Bcl-2 related proteins, but lacks the BH4 domain found only in anti-apoptotic Bcl-2 proteins. Over-expression of Bok induces apoptosis. Cell killing induced by Bok is suppressed by co-expression with selective anti-apoptotic Bcl-2 proteins. Bok is highly expressed in the ovary, testis and uterus, particularly in granulosa cells, the cell type that undergoes apoptosis during follicle atresia. Identification of Bok as a new pro-apoptotic protein with wide tissue distribution and hetero-dimerization properties facilitates elucidation of apoptosis mechanisms in reproductive and other tissues, and provides a means for manipulating apoptosis.